

regions with said channel region interposed therebetween; and

a gate electrode adjacent to said channel region with a gate insulating film interposed therebetween,

wherein each of the source and the drain regions has a portion containing one or more elements selected from the group consisting of carbon, nitrogen, and oxygen at a concentration of 1×10^{19} atoms/cm³ or more]

A semiconductor device comprising:

a semiconductor layer including a channel region and source and drain regions with said channel region interposed therebetween;

a gate electrode adjacent to said channel region with a gate insulating film interposed therebetween; and

a region formed in said semiconductor layer, said region containing one ore more elements selected from the group consisting of carbon, nitrogen, and oxygen at a concentration of 1×10^{19} atoms/cm³ or more near

wherein said region is formed in the vicinity of a boundary region between said channel region and one of said source region and said drain region.

79. (Amended) A device according to claim 78 wherein said semiconductor device has transistors [are] selected from the group consisting of stagger type, inverted stagger type, planar type, and inverted planar type transistors.

80. (Amended) A device according to claim 78 wherein said semiconductor [film] layer comprises one selected from the group consisting of silicon, germanium, and gallium arsenide.

81.(Amended) A device according to claim 78 wherein said semiconductor [film] layer comprises crystalline silicon.

14
82. (Amended) A device according to claim 78 wherein said semiconductor [film] layer comprises amorphous silicon.

15
83. (Amended) A device according to claim 78 wherein [said portion is located adjacent to a boundary between the source and the channel regions or a boundary between the drain and the channel regions] a concentration of said element in said channel region is lower than that of said element in said region.

16 17 18 19
84. (Amended) [An active matrix type display device having a plurality of pixels and a peripheral circuit, wherein said peripheral circuit comprises a CMOS device comprising n-channel and p-channel TFTs, each of said n-channel and p-channel TFTs comprising:

a semiconductor film comprising at least a channel region and source and drain regions with said channel region interposed therebetween; and

a gate electrode adjacent to said channel region with a gate insulating film interposed therebetween,

wherein said channel region has at least a portion containing one or more elements selected from the group consisting of carbon, nitrogen, and oxygen at a concentration of 1×10^{19} atoms/cm³ or more]

A semiconductor device comprising:

a semiconductor layer including a channel region and source and drain regions with said channel region interposed therebetween;

a gate electrode adjacent to said channel region with a gate insulating film interposed therebetween; and

a region having a higher energy band gap than any of said source, drain, and channel regions,

wherein said region is formed in the vicinity of a boundary region between said

10 *11* *12* *13* *14* *15* *16* *17* *18* *19* *20* *21* *22* *23* *24* *25* *26* *27* *28* *29* *30* *31* *32* *33* *34* *35* *36* *37* *38* *39* *40* *41* *42* *43* *44* *45* *46* *47* *48* *49* *50* *51* *52* *53* *54* *55* *56* *57* *58* *59* *60* *61* *62* *63* *64* *65* *66* *67* *68* *69* *70* *71* *72* *73* *74* *75* *76* *77* *78* *79* *80* *81* *82* *83* *84* *85* *86* *87* *88* *89* *90* *91* *92* *93* *94* *95* *96* *97* *98* *99* *100* *101* *102* *103* *104* *105* *106* *107* *108* *109* *110* *111* *112* *113* *114* *115* *116* *117* *118* *119* *120* *121* *122* *123* *124* *125* *126* *127* *128* *129* *130* *131* *132* *133* *134* *135* *136* *137* *138* *139* *140* *141* *142* *143* *144* *145* *146* *147* *148* *149* *150* *151* *152* *153* *154* *155* *156* *157* *158* *159* *160* *161* *162* *163* *164* *165* *166* *167* *168* *169* *170* *171* *172* *173* *174* *175* *176* *177* *178* *179* *180* *181* *182* *183* *184* *185* *186* *187* *188* *189* *190* *191* *192* *193* *194* *195* *196* *197* *198* *199* *200* *201* *202* *203* *204* *205* *206* *207* *208* *209* *210* *211* *212* *213* *214* *215* *216* *217* *218* *219* *220* *221* *222* *223* *224* *225* *226* *227* *228* *229* *230* *231* *232* *233* *234* *235* *236* *237* *238* *239* *240* *241* *242* *243* *244* *245* *246* *247* *248* *249* *250* *251* *252* *253* *254* *255* *256* *257* *258* *259* *260* *261* *262* *263* *264* *265* *266* *267* *268* *269* *270* *271* *272* *273* *274* *275* *276* *277* *278* *279* *280* *281* *282* *283* *284* *285* *286* *287* *288* *289* *290* *291* *292* *293* *294* *295* *296* *297* *298* *299* *300* *301* *302* *303* *304* *305* *306* *307* *308* *309* *310* *311* *312* *313* *314* *315* *316* *317* *318* *319* *320* *321* *322* *323* *324* *325* *326* *327* *328* *329* *330* *331* *332* *333* *334* *335* *336* *337* *338* *339* *340* *341* *342* *343* *344* *345* *346* *347* *348* *349* *350* *351* *352* *353* *354* *355* *356* *357* *358* *359* *360* *361* *362* *363* *364* *365* *366* *367* *368* *369* *370* *371* *372* *373* *374* *375* *376* *377* *378* *379* *380* *381* *382* *383* *384* *385* *386* *387* *388* *389* *390* *391* *392* *393* *394* *395* *396* *397* *398* *399* *400* *401* *402* *403* *404* *405* *406* *407* *408* *409* *410* *411* *412* *413* *414* *415* *416* *417* *418* *419* *420* *421* *422* *423* *424* *425* *426* *427* *428* *429* *430* *431* *432* *433* *434* *435* *436* *437* *438* *439* *440* *441* *442* *443* *444* *445* *446* *447* *448* *449* *450* *451* *452* *453* *454* *455* *456* *457* *458* *459* *460* *461* *462* *463* *464* *465* *466* *467* *468* *469* *470* *471* *472* *473* *474* *475* *476* *477* *478* *479* *480* *481* *482* *483* *484* *485* *486* *487* *488* *489* *490* *491* *492* *493* *494* *495* *496* *497* *498* *499* *500* *501* *502* *503* *504* *505* *506* *507* *508* *509* *510* *511* *512* *513* *514* *515* *516* *517* *518* *519* *520* *521* *522* *523* *524* *525* *526* *527* *528* *529* *530* *531* *532* *533* *534* *535* *536* *537* *538* *539* *540* *541* *542* *543* *544* *545* *546* *547* *548* *549* *550* *551* *552* *553* *554* *555* *556* *557* *558* *559* *560* *561* *562* *563* *564* *565* *566* *567* *568* *569* *570* *571* *572* *573* *574* *575* *576* *577* *578* *579* *580* *581* *582* *583* *584* *585* *586* *587* *588* *589* *590* *591* *592* *593* *594* *595* *596* *597* *598* *599* *600* *601* *602* *603* *604* *605* *606* *607* *608* *609* *610* *611* *612* *613* *614* *615* *616* *617* *618* *619* *620* *621* *622* *623* *624* *625* *626* *627* *628* *629* *630* *631* *632* *633* *634* *635* *636* *637* *638* *639* *640* *641* *642* *643* *644* *645* *646* *647* *648* *649* *650* *651* *652* *653* *654* *655* *656* *657* *658* *659* *660* *661* *662* *663* *664* *665* *666* *667* *668* *669* *670* *671* *672* *673* *674* *675* *676* *677* *678* *679* *680* *681* *682* *683* *684* *685* *686* *687* *688* *689* *690* *691* *692* *693* *694* *695* *696* *697* *698* *699* *700* *701* *702* *703* *704* *705* *706* *707* *708* *709* *710* *711* *712* *713* *714* *715* *716* *717* *718* *719* *720* *721* *722* *723* *724* *725* *726* *727* *728* *729* *730* *731* *732* *733* *734* *735* *736* *737* *738* *739* *740* *741* *742* *743* *744* *745* *746* *747* *748* *749* *750* *751* *752* *753* *754* *755* *756* *757* *758* *759* *760* *761* *762* *763* *764* *765* *766* *767* *768* *769* *770* *771* *772* *773* *774* *775* *776* *777* *778* *779* *780* *781* *782* *783* *784* *785* *786* *787* *788* *789* *790* *791* *792* *793* *794* *795* *796* *797* *798* *799* *800* *801* *802* *803* *804* *805* *806* *807* *808* *809* *810* *811* *812* *813* *814* *815* *816* *817* *818* *819* *820* *821* *822* *823* *824* *825* *826* *827* *828* *829* *830* *831* *832* *833* *834* *835* *836* *837* *838* *839* *840* *841* *842* *843* *844* *845* *846* *847* *848* *849* *850* *851* *852* *853* *854* *855* *856* *857* *858* *859* *860* *861* *862* *863* *864* *865* *866* *867* *868* *869* *870* *871* *872* *873* *874* *875* *876* *877* *878* *879* *880* *881* *882* *883* *884* *885* *886* *887* *888* *889* *890* *891* *892* *893* *894* *895* *896* *897* *898* *899* *900* *901* *902* *903* *904* *905* *906* *907* *908* *909* *910* *911* *912* *913* *914* *915* *916* *917* *918* *919* *920* *921* *922* *923* *924* *925* *926* *927* *928* *929* *930* *931* *932* *933* *934* *935* *936* *937* *938* *939* *940* *941* *942* *943* *944* *945* *946* *947* *948* *949* *950* *951* *952* *953* *954* *955* *956* *957* *958* *959* *960* *961* *962* *963* *964* *965* *966* *967* *968* *969* *970* *971* *972* *973* *974* *975* *976* *977* *978* *979* *980* *981* *982* *983* *984* *985* *986* *987* *988* *989* *990* *991* *992* *993* *994* *995* *996* *997* *998* *999* *1000* *1001* *1002* *1003* *1004* *1005* *1006* *1007* *1008* *1009* *1010* *1011* *1012* *1013* *1014* *1015* *1016* *1017* *1018* *1019* *1020* *1021* *1022* *1023* *1024* *1025* *1026* *1027* *1028* *1029* *1030* *1031* *1032* *1033* *1034* *1035* *1036* *1037* *1038* *1039* *1040* *1041* *1042* *1043* *1044* *1045* *1046* *1047* *1048* *1049* *1050* *1051* *1052* *1053* *1054* *1055* *1056* *1057* *1058* *1059* *1060* *1061* *1062* *1063* *1064* *1065* *1066* *1067* *1068* *1069* *1070* *1071* *1072* *1073* *1074* *1075* *1076* *1077* *1078* *1079* *1080* *1081* *1082* *1083* *1084* *1085* *1086* *1087* *1088* *1089* *1090* *1091* *1092* *1093* *1094* *1095* *1096* *1097* *1098* *1099* *1100* *1101* *1102* *1103* *1104* *1105* *1106* *1107* *1108* *1109* *1110* *1111* *1112* *1113* *1114* *1115* *1116* *1117* *1118* *1119* *11100* *11101* *11102* *11103* *11104* *11105* *11106* *11107* *11108* *11109* *11110* *11111* *11112* *11113* *11114* *11115* *11116* *11117* *11118* *11119* *11120* *11121* *11122* *11123* *11124* *11125* *11126* *11127* *11128* *11129* *11130* *11131* *11132* *11133* *11134* *11135* *11136* *11137* *11138* *11139* *11140* *11141* *11142* *11143* *11144* *11145* *11146* *11147* *11148* *11149* *11150* *11151* *11152* *11153* *11154* *11155* *11156* *11157* *11158* *11159* *11160* *11161* *11162* *11163* *11164* *11165* *11166* *11167* *11168* *11169* *11170* *11171* *11172* *11173* *11174* *11175* *11176* *11177* *11178* *11179* *11180* *11181* *11182* *11183* *11184* *11185* *11186* *11187* *11188* *11189* *11190* *11191* *11192* *11193* *11194* *11195* *11196* *11197* *11198* *11199* *111000* *111001* *111002* *111003* *111004* *111005* *111006* *111007* *111008* *111009* *111010* *111011* *111012* *111*

a gate electrode adjacent to said channel region with a gate insulating film interposed therebetween,

wherein each of the source and the drain regions has a portion containing one or more elements selected from the group consisting of carbon, nitrogen, and oxygen at a concentration of 1×10^{19} atoms/cm³ or more, and

JH Crst
wherein said channel region contains boron at a concentration of from 1×10^{15} to 5×10^{17} atoms/cm³]

A display device having a plurality of pixels and at least one driver circuit for driving said pixels, said driver circuit comprising:

a semiconductor layer including a channel region and source and drain regions with said channel region interposed therebetween;

a gate electrode adjacent to said channel region with a gate insulating film interposed therebetween; and

a region formed in said semiconductor layer, said region containing one ore more elements selected from the group consisting of carbon, nitrogen, and oxygen at a concentration of 1×10^{19} atoms/cm³ or more,

wherein said region is formed in the vicinity of a boundary region between said channel region and one of said source region and said drain region.

112X
91. (Amended) A device according to claim 90 wherein said display device has transistors [are] selected from the group consisting of stagger type, inverted stagger type, planar type, and inverted planar type transistors.

113
92. (Amended) A device according to claim 90 wherein said semiconductor [film] layer comprises one selected from the group consisting of silicon, germanium, and gallium arsenide.

114
93. (Amended) A device according to claim 90 wherein said semiconductor [film] layer comprises crystalline silicon.

115
94. (Amended) A device according to claim 90 wherein [absolute value of a threshold voltage of said n-channel TFT is approximately equivalent to that of p-channel TFTs] said driver circuit has at least a CMOS circuit comprising a pair of an n-channel TFT and a p-channel TFT.

116
95. (Amended) A device according to claim 90 wherein [said portion is located adjacent to a boundary between the source and the channel regions or a boundary between the drain and the channel regions] a concentration of said element in said channel region is lower than that of said element in said region.

117
96. (Amended) [An active matrix type display device having a plurality of pixels and a peripheral circuit, wherein said peripheral circuit comprises a CMOS device comprising n-channel and p-channel TFTs, each of said n-channel and p-channel TFTs comprising:

a semiconductor film comprising at least a channel region and source and drain regions with said channel region interposed therebetween; and

a gate electrode adjacent to said channel region with a gate insulating film interposed therebetween,

wherein said channel region has at least a portion containing one or more elements selected from the group consisting of carbon, nitrogen, and oxygen at a concentration of 1×10^{19} atoms/cm³ or more, and

wherein said channel region contains boron at a concentration of from 1×10^{15} to 5×10^{17} atoms/cm³]

A display device having a plurality of pixels and at least one driver circuit for driving said pixels, said driver circuit comprising:

I16 Cmt
a semiconductor layer including a channel region and source and drain regions with said channel region interposed therebetween;

a gate electrode adjacent to said channel region with a gate insulating film interposed therebetween; and

a region having a higher energy band gap than any of said source, drain, and channel regions.

wherein said region is formed in the vicinity of a boundary region between said channel region and one of said source region and said drain region.

I17 P12
97. (Amended) A device according to claim 96 wherein said display device has transistors [are] selected from the group consisting of stagger type, inverted stagger type, planar type, and inverted planar type transistors.

I18
98. (Amended) A device according to claim 96 wherein said semiconductor [film] layer comprises one selected from the group consisting of silicon, germanium, and gallium arsenide.

99. (Amended) A device according to claim 96 wherein said semiconductor [film] layer comprises crystalline silicon.

I19
100. (Amended) A device according to claim 96 wherein [absolute value of a threshold voltage of said n-channel TFT is approximately equivalent to that of p-channel TFTs] said driver circuit has at least a CMOS circuit comprising a pair of an n-channel TFT and a p-channel TFT.

I20
101. (Amended) A device according to clam 96 wherein said [portion is located adjacent to a boundary between the source and the channel regions or a boundary between

the drain and the channel regions] region containing one ore more elements selected from the group consisting of carbon, nitrogen, and oxygen at a concentration of 1×10^{19} atoms/cm³ or more.

I21 SPC
102. (Amended) [An active matrix type display device having a plurality of pixels and a peripheral circuit, wherein said peripheral circuit comprises a CMOS device comprising n-channel and p-channel TFTs, each of said n-channel and p-channel TFTs comprising:

a semiconductor film comprising at least a channel region and source and drain regions with said channel region interposed therebetween; and

a gate electrode under said channel region with a gate insulating film interposed therebetween,

wherein each of the source and the drain regions has a portion containing one or more elements selected from the group consisting of carbon, nitrogen, and oxygen at a concentration of 1×10^{19} atoms/cm³ or more]

A display device having a plurality of pixels and at least one driver circuit for driving said pixels, said driver circuit comprising:

a semiconductor layer including a channel region and source and drain regions with said channel region interposed therebetween; and

a gate electrode adjacent to said channel region with a gate insulating film interposed therebetween;

wherein said semiconductor layer has at least one region including carbon at least one boundary region in the vicinity of at least one of a source-channel boundary and a drain-channel boundary at concentration of 1×10^{19} atoms/cm³ or more.

I22
103. (Amended) A device according to claim 102 wherein said semiconductor [film] layer comprises amorphous silicon.

104. (Amended) A device according to claim 102 [further comprising:
a first interlayer insulating film over said semiconductor film and said gate electrode,
said first interlayer insulating film comprising inorganic material; and
TJ22
a second interlayer insulating film on said first interlayer insulating film, said second
interlayer insulating film comprising organic resin,

wherein said active matrix type display device is a transparent type or a reflective type
device] wherein said driver circuit has at least a CMOS circuit comprising a pair of an n-
channel TFT and a p-channel TFT.

TJ23
106. (Amended) A device according to claim 102 wherein said semiconductor [film]
layer comprises one selected from the group consisting of silicon, germanium, and gallium
arsenide.

107. (Amended) A device according to claim 102 wherein said semiconductor [film]
layer comprises crystalline silicon.

TJ24
108. (Amended) A device according to claim [102] 104 wherein absolute value of a
threshold voltage of said n-channel TFT is approximately equivalent to that of p-channel
TFT[s].

*Ault
PC9*
109. (Amended) A device according to claim 102 wherein said [portion is located
adjacent to a boundary between the source and the channel regions or a boundary between
the drain and the channel regions] display device has transistors selected from the group
consisting of stagger type, inverted stagger type, planar type, and inverted planar type
transistors.

110. (Amended) [An active matrix type display device having a plurality of pixels and

a peripheral circuit, wherein said peripheral circuit comprises a CMOS device comprising n-channel and p-channel TFTs, each of said n-channel and p-channel TFTs comprising:

a semiconductor film comprising at least a channel region and source and drain regions with said channel region interposed therebetween; and

a gate electrode adjacent to said channel region with a gate insulating film interposed therebetween,

wherein said channel region has at least two portions containing one or more elements selected from the group consisting of carbon, nitrogen, and oxygen at a concentration of 1×10^{19} atoms/cm³ or more]

A display device having a plurality of pixels and at least one driver circuit for driving said pixels, said driver circuit comprising:

a semiconductor layer including a channel region and source and drain regions with said channel region interposed therebetween; and

a gate electrode adjacent to said channel region with a gate insulating film interposed therebetween;

wherein said semiconductor layer has at least one region including nitrogen at least one boundary region in the vicinity of at least one of a source-channel boundary and a drain-channel boundary at concentration of 1×10^{19} atoms/cm³ or more.

112. (Amended) A device according to claim 110 [further comprising:

a first interlayer insulating film over said semiconductor film and said gate electrode, said first interlayer insulating film comprising inorganic material; a

a second interlayer insulating film on said first interlayer insulating film, said second interlayer insulating film comprising organic resin,

wherein said active matrix type display device is a transparent type or a reflective type device] wherein said driver circuit has at least a CMOS circuit comprising a pair of an n-channel TFT and a p-channel TFT.

T26
113. (Amended) A device according to claim 110 wherein said semiconductor [film] layer comprises crystalline silicon.

T27
114. (Amended) A device according to claim 110 wherein said semiconductor [film] layer comprises one selected from the group consisting of silicon, germanium, and gallium arsenide.

115. (Amended) A device according to claim 110 wherein said semiconductor [film] layer comprises amorphous silicon.

T28
116. (Amended) A device according to claim [110] 112 wherein absolute value of a threshold voltage of said n-channel TFT is approximately equivalent to that of p-channel TFTs.

*stagger
IC10*
117. (Amended) A device according to claim 110 wherein [each of said portions is located adjacent to a boundary between the source and the channel regions or a boundary between the drain and the channel regions] said display device has transistors selected from the group consisting of stagger type, inverted stagger type, planar type, and inverted planar type transistors.

118. (Amended) [An active matrix type display device having a plurality of pixels, each pixel comprising:

a semiconductor film comprising at least a channel region and source and drain regions with said channel region interposed therebetween; and

a gate electrode adjacent to said channel region with a gate insulating film interposed therebetween,

Tony Clark
wherein each of the source and the drain regions has a portion containing one or more elements selected from the group consisting of carbon, nitrogen, and oxygen at a concentration of 1×10^{19} atoms/cm³ or more]

A display device having a plurality of pixels and at least one driver circuit for driving said pixels, said driver circuit comprising:

a semiconductor layer including a channel region and source and drain regions with said channel region interposed therebetween; and

a gate electrode adjacent to said channel region with a gate insulating film interposed therebetween;

wherein said semiconductor layer has at least one region including oxygen at least one boundary region in the vicinity of at least one of a source-channel boundary and a drain-channel boundary at concentration of 1×10^{19} atoms/cm³ or more.

J29
120. (Amended) A device according to claim 118 [further comprising:

a first interlayer insulating film over said semiconductor film and said gate electrode, said first interlayer insulating film comprising inorganic material;

a second interlayer insulating film on said first interlayer insulating film, said second interlayer insulating film comprising organic resin; and

a pixel electrode on said second interlayer insulating film,

wherein said active matrix type display device is a transparent type or a reflective type device] wherein said driver circuit has at least a CMOS circuit comprising a pair of an n-channel TFT and a p-channel TFT.

J30 Pull
121. (Amended) A device according to claim 118 wherein said [active matrix type] display device comprises transistors selected from the group consisting of stagger type, inverted stagger type, planar type, and inverted planar type transistors.

J31
122. (Amended) A device according to claim 118 wherein said semiconductor [film] layer comprises one selected from the group consisting of silicon, germanium, and gallium arsenide.

J32
123. (Amended) A device according to claim 118 wherein said semiconductor [film] layer comprises crystalline silicon.

J32
124. (Amended) A device according to claim 118 wherein said semiconductor [film] layer comprises amorphous silicon.

125. (Amended) A device according to claim 118 wherein [said portion is located adjacent to a boundary between the source and the channel regions or a boundary between the drain and the channel regions] a concentration of said element in said channel region is lower than that of said element in said region.

Part II
126. (Amended) [An active matrix type display device having a plurality of pixels, each pixel comprising:

a semiconductor film comprising at least a channel region and source and drain regions with said channel region interposed therebetween; and

a gate electrode adjacent to said channel region with a gate insulating film interposed therebetween,

wherein said channel region has at least two portions containing one or more elements selected from the group consisting of carbon, nitrogen, and oxygen at a concentration of 1×10^{19} atoms/cm³ or more]

A display device having a plurality of pixels and at least one driver circuit for driving said pixels, each of said pixels comprising:

a semiconductor layer including a channel region and source and drain regions

with said channel region interposed therebetween;

a gate electrode adjacent to said channel region with a gate insulating film interposed therebetween; and

a region formed in said semiconductor layer, said region containing one or more elements selected from the group consisting of carbon, nitrogen, and oxygen at a concentration of 1×10^{19} atoms/cm³ or more,

wherein said region is formed in the vicinity of a boundary region between said channel region and one of said source region and said drain region.

133 128. (Amended) A device according to claim 126 further comprising:

a first interlayer insulating film over said semiconductor [film] layer and said gate electrode, said first interlayer insulating film comprising inorganic material;

a second interlayer insulating film on said first interlayer insulating film, said second interlayer insulating film comprising organic resin; and

a pixel electrode on said second interlayer insulating film[,

wherein said active matrix type display device is a transparent type or a reflective type device].

134 130. (Amended) A device according to claim 126 wherein said semiconductor [film] layer comprises one selected from the group consisting of silicon, germanium, and gallium arsenide.

131. (Amended) A device according to claim 126 wherein said semiconductor [film] layer comprises crystalline silicon.

135 132. (Amended) A device according to claim 126 wherein said semiconductor [film] layer comprises amorphous silicon.

J35
J34

133. (Amended) A device according to claim 126 wherein [each of said portions is located adjacent to a boundary between the source and the channel regions or a boundary between the drain and the channel regions] a concentration of said element in said channel region is lower than that of said element in said region.

134. (Amended) [An active matrix type display device having a plurality of pixels, each pixel comprising:

a semiconductor film comprising at least a channel region and source and drain regions with said channel region interposed therebetween;

a gate electrode adjacent to said channel region with a gate insulating film interposed therebetween; and

a pixel electrode connected to said semiconductor film,

wherein each of the source and the drain regions has a portion containing one or more elements selected from the group consisting of carbon, nitrogen, and oxygen at a concentration of 1×10^{19} atoms/cm³ or more, and

wherein said channel region contains boron at a concentration of from 1×10^{15} to 5×10^{17} atoms/cm³]

A display device having a plurality of pixels and at least one driver circuit for driving said pixels, each of said pixels comprising:

a semiconductor layer including a channel region and source and drain regions with said channel region interposed therebetween;

a gate electrode adjacent to said channel region with a gate insulating film interposed therebetween; and

a region having a higher energy band gap than any of said source, drain, and channel regions.

wherein said region is formed in the vicinity of a boundary region between said channel region and one of said source region and said drain region.

(36)
135. (Amended) A device according to claim 134 wherein said [active matrix type] display device comprises transistors selected from the group consisting of stagger type, inverted stagger type, planar type, and inverted planar type transistors.

(36)
136. (Amended) A device according to claim 134 wherein said semiconductor [film] layer comprises one selected from the group consisting of silicon, germanium, and gallium arsenide.

137. (Amended) A device according to claim 134 wherein said semiconductor [film] layer comprises crystalline silicon.

(36)
139. (Amended) A device according to claim 134 [wherein said portion is located adjacent to a boundary between the source and the channel regions or a boundary between the drain and the channel regions] further comprising a first interlayer insulating film over said semiconductor layer and said gate electrode, said first interlayer insulating film comprising inorganic material; a second interlayer insulating film on said first interlayer insulating film, said second interlayer insulating film comprising organic resin; and a pixel electrode on said second interlayer insulating film.

(36)
140. (Amended) [An active matrix type display device having a plurality of pixels, each pixel comprising:

a semiconductor film comprising at least a channel region and source and drain regions with said channel region interposed therebetween;

a gate electrode adjacent to said channel region with a gate insulating film interposed therebetween; and

a pixel electrode connected to said semiconductor film,

wherein said channel region has a portion containing one or more elements

selected from the group consisting of carbon, nitrogen, and oxygen at a concentration of 1×10^{19} atoms/cm³ or more, and

wherein said channel region contains boron at a concentration of from 1×10^{15} to 5×10^{17} atoms/cm³]

A display device having a plurality of pixels and at least one driver circuit for driving said pixels, each of said pixels comprising:

a semiconductor layer including a channel region and source and drain regions with said channel region interposed therebetween; and

a gate electrode adjacent to said channel region with a gate insulating film interposed therebetween;

wherein said semiconductor layer has at least one region including carbon at least one boundary region in the vicinity of at least one of a source-channel boundary and a drain-channel boundary at concentration of 1×10^{19} atoms/cm³ or more.

141. (Amended) A device according to claim 140 wherein said [semiconductor active matrix type] display device comprises transistors selected from the group consisting of stagger type, inverted stagger type, planar type, and inverted planar type transistors.

142. (Amended) A device according to claim 140 wherein said semiconductor [film] layer comprises one selected from the group consisting of silicon, germanium, and gallium arsenide.

143. (Amended) A device according to claim 140 wherein said semiconductor [film] layer comprises crystalline silicon.

145. (Amended) A device according to claim 140 [wherein said portion is located adjacent to a boundary between the source and the channel regions or a boundary between

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the drain and the channel regions] further comprising a first interlayer insulating film over said semiconductor layer and said gate electrode, said first interlayer insulating film comprising inorganic material; a second interlayer insulating film on said first interlayer insulating film, said second interlayer insulating film comprising organic resin; and a pixel electrode on said second interlayer insulating film.

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146. (Amended) [An active matrix type display device having a plurality of pixels, each pixel comprising:

a semiconductor film comprising at least a channel region and source and drain regions with said channel region interposed therebetween;

a gate electrode under said channel region with a gate insulating film interposed therebetween; and

a pixel electrode connected to said semiconductor film,

wherein each of the source and the drain regions has a portion containing one or more elements selected from the group consisting of carbon, nitrogen, and oxygen at a concentration of 1×10^{19} atoms/cm³ or more]

A display device having a plurality of pixels and at least one driver circuit for driving said pixels, each of said pixels comprising:

a semiconductor layer including a channel region and source and drain regions with said channel region interposed therebetween; and

a gate electrode adjacent to said channel region with a gate insulating film interposed therebetween;

wherein said semiconductor layer has at least one region including nitrogen at least one boundary region in the vicinity of at least one of a source-channel boundary and a drain-channel boundary at concentration of 1×10^{19} atoms/cm³ or more.

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148. (Amended) A device according to claim 146 wherein said semiconductor

[film] layer comprises one selected from the group consisting of silicon, germanium, and gallium arsenide.

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149. (Amended) A device according to claim 146 wherein said [non-single crystalline] semiconductor layer comprises one selected from the group consisting of amorphous silicon, polycrystalline silicon, and semi-crystalline silicon.

JES PCT 19

151. (Amended) A device according to claim 146 wherein said [portion is located adjacent to a boundary between the source and the channel regions or a boundary between the drain and the channel regions] display device has transistors selected from the group consisting of stagger type, inverted stagger type, planar type, and inverted planar type transistors.

JES PCT 19

152. (Amended) [An active matrix type display device having a plurality of pixels, each pixel comprising:

a semiconductor film comprising at least a channel region and source and drain regions with said channel region interposed therebetween;

a gate electrode under said channel region with a gate insulating film interposed therebetween; and

a pixel electrode connected to said semiconductor film,

wherein said channel region has at least a portion containing one or more elements selected from the group consisting of carbon, nitrogen, and oxygen at a concentration of 1×10^{19} atoms/cm³ or more]

A display device having a plurality of pixels and at least one driver circuit for driving said pixels, each of said pixels comprising:

a semiconductor layer including a channel region and source and drain regions with said channel region interposed therebetween; and